

Diamond abrasive products —

Part 1: Specification for diamond and cubic boron nitride abrasive grinding wheels

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The organizations marked with an asterisk in the above list together with the following, were directly represented on the committee entrusted with the preparation of this British Standard.

This British Standard, having been prepared under the direction of the Mechanical Engineering Standards Committee, was published under the authority of the Executive Board on 30 June 1976

- British Diamond Die Federation
- British Hard Metal Association
- British Ophthalmic Lens Manufacturers' Association
- Diamond Bonded Products Association
- Federation of Manufacturing Opticians
- Gauge and Tool Makers' Association
- National Federation of Engineers' Tool Manufacturers

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Foreword

This Part of this standard supersedes BS 2064, which was first published in 1953, and has been prepared under the authority of the Mechanical Engineering Standards Committee.

It is in metric units and is the result of work carried out by the Fédération Européenne des Fabricants de Produits Abrasifs (FEPA).

The designation system specified is that which is used by the American National Standards Institute and is now widely used in Europe.

The dimensions and shapes are equally applicable to wheels made from cubic boron nitride.

Appendix A shows the shapes of standard wheels; those in most common use are included in Table 1 to Table 15.

Appendix B shows the terminology associated with various features of the wheels in other languages.

Part 2 of this standard deals with diamond abrasive circular and frame saw blades.

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Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 18, an inside back cover and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

1 Scope

This Part of this British Standard relates to diamond and cubic boron nitride abrasive grinding wheels. It describes the system to be used for designating the wheel shapes and lists shapes and dimensions of wheels in common use.

2 Reference

The title of the publication referred to in this standard is given on the inside back cover.

3 Diamond concentration

As a basis value for the diamond concentration in grinding wheels

100 is equivalent to 4.4 carats/cm³ (0.88 g/cm³)

This figure corresponds to 25 % by volume, given the density of diamond as 3.52 g/cm³. All other concentrations are proportional, e.g. 125, 75, 50.

4 System of designation for diamond wheel shapes

4.1 This system is designed to describe the shape of complete diamond abrasive grinding wheels either solid or built of component parts. The system is made up from four principal components each of which occupies a particular position as specified in 4.1.1 to 4.1.4. An example of the designation system is given in Figure 3.

4.1.1 *Position in designation system: core shape.* A number that designates the basic shape of the core on which the diamond section is mounted, and that follows the general pattern in use for other abrasive wheel shape types.

The number shall be irrespective of such considerations as the location of the diamond abrasive section or the intended use of the wheel.

The forming of a recess into the core for the placing of the diamond abrasive on a clearance or relief angle formed on the core shall not affect the typing of the basic core shape.

The numbers to be used in this position, associated with the basic core shapes, are shown in Figure 1.

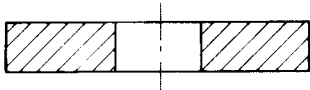
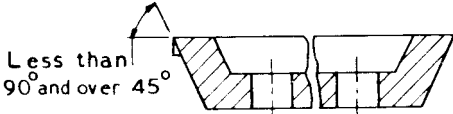
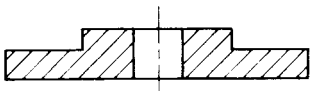
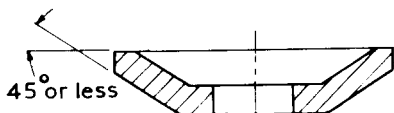
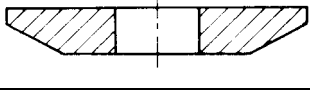
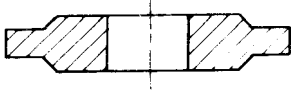
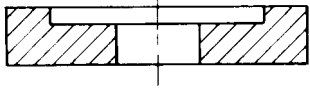
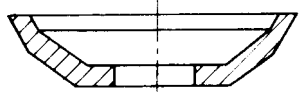
Designation	Core shape	Designation	Core shape
1		9	
2		11	
3		12	
4		14	
6		15	

Figure 1 — Numbers to be used in position 1

4.1.2 Position 2 in designation system: shape of diamond section. A letter (or letters) that designates the cross-sectional shape of the diamond abrasive section and that follows the general pattern in use for wheel face shapes of other abrasive wheels.

The designation letter shall be irrespective of the location of the diamond abrasive section on the core.

The section may turn about any axis and shall consist of four surfaces: an outside surface, an inside surface, and two sides.

The letters to be used in this position, associated with the various diamond abrasive cross sections, are shown in Figure 2.

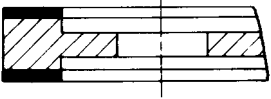
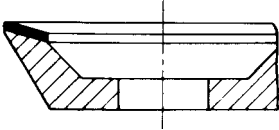
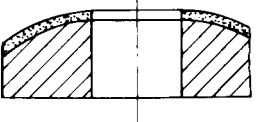
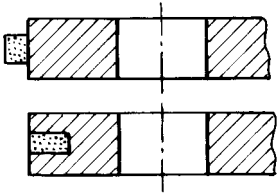
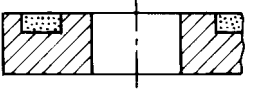
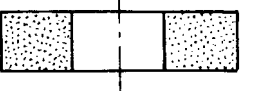
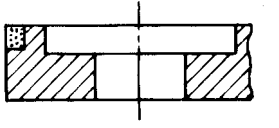
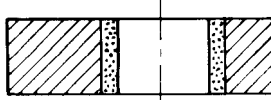
Designation	Shape	Designation	Shape	Designation	Shape	Designation	Shape	Designation	Shape
A		D		FF		L		QQ	
AH		DD		G		LL		S	
B		E		H		M		U	
C		EE		J		P		V	
CH		F		K		Q		Y	

Figure 2 — Letters to be used in position 2

4.1.3 Position 3 in designation system: location of diamond section. A number that indicates the location of the diamond abrasive section on the core. Generally the section is mounted on the core in such a position that the exterior point of any angle or the convex side of any arc is protruding.

The numbers to be used in this position, related to the position of the section on the core, are as follows:

Designation	Location	Definition or requirement	Illustration
1	Periphery	The diamond section shall be placed on the periphery of the core and shall extend the full thickness of the wheel. The axial length of this section may be greater than, equal to, or less than the depth of diamond, measured radially. A hub or hubs shall not be considered as part of the wheel thickness for the purpose of this definition.	
2	Side	The diamond section shall be placed on the side of the wheel and the length of the diamond section shall extend from the periphery towards the centre. It may or may not include the entire side and shall be greater than the diamond depth measured axially. It shall be on that side of the wheel which is commonly used for grinding purposes.	

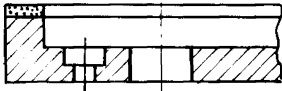
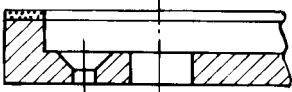
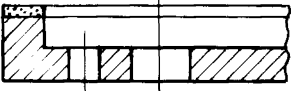
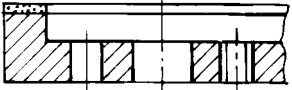
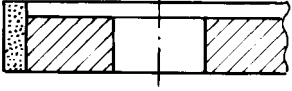
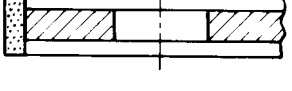
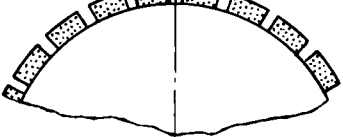
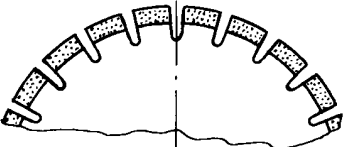
Designation	Location	Definition or requirement	Illustration
3	Both sides	The diamond sections shall be placed on both sides of the wheel and shall extend from the periphery towards the centre. They may or may not include the entire sides, and the radial Length of the diamond section shall exceed the axial diamond depth.	
4	Inside bevel or arc	This designation shall apply to the general wheel types 2, 6, 11, 12 and 15, and shall locate the diamond section on the side wall. This wall shall have an angle or arc extending from a higher point at the wheel periphery to a lower point towards the wheel centre.	
5	Outside bevel or arc	This designation shall apply to the general wheel types 2, 6, 11 and 15 and shall locate the diamond section on the side wall. This wall shall have an angle or arc extending from a lower point at the wheel periphery to a higher point towards the wheel centre.	
6	Part of periphery	The diamond section shall be placed on the periphery of the core but shall not extend the full thickness of the wheel and shall not reach to either side.	
7	Part of side	The diamond section shall be placed on the side of the core and shall not extend to the wheel periphery. It may or may not extend to the centre.	
8	Throughout	This shall designate wheels of solid diamond abrasive section without cores.	
9	Corner	This shall designate a location which would commonly be considered to be on the periphery except that the diamond section shall be on one corner but shall not extend to the other corner.	
10	Annular	This shall designate a location of the diamond abrasive section on the inner annular surface of the wheel.	

4.1.4 Position 4 in designation system: modifications to standard types. A letter (or letters) that indicates modifications to standard types.

This position in the designation system need be used only when required.

Modifications to standard wheel shapes may be made at will within the assigned definitions that follow.

When it is necessary for this position to be used, the designation letters shall be as follows.

Designation	Modification	Definition or requirement	Illustration
B	Drill and counterbore	Holes drilled and counterbored in core.	
C	Drill and countersink	Holes drilled and countersunk in core.	
H	Plain hole	Straight hole drilled in core.	
M	Holes plain and threaded	Mixed holes, some plain, some threaded, in the core.	
P	Relieved one side	Relief on one side of wheel, thickness of core less than wheel thickness.	
Q	Diamond inserted	Three surfaces of the diamond section shall be partially or completely enclosed by the core.	
R	Relieved two sides	Relief on both sides of wheel. The thickness of the core is less than the wheel thickness.	
S	Segmented diamond sections	Wheel having diamond segments mounted on <i>solid</i> rim. (Clearance between segments has no bearing on definition.)	
SS	Segmented and slotted	Wheel having diamond segments mounted on <i>solid</i> and <i>slotted</i> core.	
T	Threaded holes	Threaded holes in core.	
V	Diamond inverted	Any diamond cross section shall be considered inverted if it is mounted on the core so that the interior point of any angle, or the concave side of any arc, is exposed. <i>Exception.</i> Diamond cross section AH shall be placed on the core with the concave side of the arc exposed.	